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TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLE:—Poisonous Mushrooms 469
Notes on Cultivated Conifers.—IX . . . . . *C. S. S.* 469
Autumn Fruits in the Pines . . . . . *Mrs. Mary Treat.* 471
NEW OR LITTLE-KNOWN PLANTS:—Alnus tinctoria. (With figure.) . . . . . *C. S. S.* 472
FOREIGN CORRESPONDENCE:—Chrysanthemums . . . . . *W. Watson.* 472
CULTURAL DEPARTMENT:—Greenhouse Cultivation for Amateurs . . *J. N. Gerard.* 474
Autumn Protection . . . . . *E. O. Orpet.* 475
Wintering Bedding Stock . . . . . *T. D. Hatfield.* 476
Iris alata . . . . . *J. N. G.* 476
THE FOREST:—Forestry in Women's Clubs.—II . . . . . *M. B. C.* 476
NOTES 478
ILLUSTRATION:—Alnus tinctoria, Fig. 59 473

Poisonous Mushrooms.

THE two cases of poisoning from eating Amanita muscaria, one terminating fatally, which occurred recently in the city of Washington, tend to strengthen the belief that it is almost hopeless to expect that the time will ever come when a knowledge of the distinctive marks of our common poisonous fungi will be so widely spread that serious accidents need not be feared. The victim in this case was Count de Vecchi, a man of intelligence, educated in Italy, and supposed to be well informed about edible and poisonous fungi. Furthermore, there was evidence to show that he had in his possession and had apparently recently consulted a pamphlet in which the dangerous A. muscaria was described and figured, and yet, in spite of all this, he deliberately selected that poisonous species for his table. If Count de Vecchi could be thus mistaken, what could be expected of persons of less education and experience?

The present case should serve as a warning in several respects. In some parts of the country there has sprung up suddenly a mania for fungus-eating, which has been carried to such an extent that not a small number of persons have convinced themselves that nearly all our larger toadstools are not only not injurious, but really palatable. It is, of course, useless to question what is a matter of taste, but when it goes so far that it is seriously maintained that even A. muscaria is edible, as is claimed by some enthusiastic mycophagists, the present fatal case is decidedly instructive. The determination of the fungus was made by experts of the Agricultural Department, and it cannot be supposed that they were not familiar with this common species. Even were it true that A. muscaria is sometimes poisonous and sometimes not—and it should be borne in mind that this assumption has never yet been shown to be a fact—the present case shows that it certainly is not a species to be eaten.

As articles of food fungi belong to a quite different category from that of other substances. In the case of meat the butcher knows what he is about when he sells, and his customer in buying knows that, however he may be cheated as to price and quality, he is not purchasing what may kill him in a few hours. Fungi are rather to be compared with drugs in an apothecary's shop, where, with some which are harmless, are others which are highly poisonous, and none but persons of special training are allowed to dispense them. The danger of mistake through ignorance is recognized and the conditions of the sale of drugs are regulated by law. In countries where fungi are largely eaten the danger of mistaking harmful for harmless species is recognized, and experts are appointed to examine fungi offered for sale. So far the comparative exemption from fungus-poisoning in this country has been due to the fact that dealers have been afraid to sell, and purchasers to buy, anything but the cultivated mushroom, Agaricus campestris, or, perhaps, in a few eastern cities, Coprinus comatus. This caution has been carried so far that, a few years ago, a gentleman in Washington who raised large quantities of a delicious native species closely resembling the common mushroom, was obliged to abandon the culture on a large scale because no dealer could be persuaded to buy his fungi in spite of their close resemblance to the ordinary mushroom.

Considering the increasing fondness for fungi in this country and knowing that it is next to hopeless to suppose that persons who are fond of eating fungi will be able to become experts in distinguishing edible from poisonous species, the time seems to have arrived when the sale of fungi should be controlled by law. During the winter months, especially in the northern states, practically nothing is sold but the cultivated mushroom, and there is no need of restricting the sale at that season. But during the summer months when, in some parts of the country, it is the custom for farmers and others to bring to market fungi which they have found growing wild, they should be compelled to sell their goods only at authorized places and authorized hours, and there should be appointed experts to examine all fungi sold. The experts could be paid wholly or in part by fees received from those selling fungi. This system has worked well in parts of France and Italy, especially in towns of moderate size. In very large cities, as a rule, the variety of fungi offered for sale is smaller than in towns situated in rural districts. Although we advise the appointment of expert examiners, the advantage to be derived thereby will not probably be so great as in countries like France and Italy. There fungi form a larger portion of the food of the poorer classes than with us. In this country the greatest danger at the present time is that the upper and middle classes, with whom it is becoming more and more the fashion to collect fungi in the fields and woods for their own consumption, will, perhaps, trust too much to chance and exceed the bounds of ordinary prudence. We are, perhaps, warranted in believing that the amateur fungus collector of the present day is attracted not altogether by the intrinsic value of fungi as food, but finds a certain pleasure in the knowledge that he is running some risk of being poisoned. However that may be, there is good reason why the sale of fungi should be guarded by law in the interest of those who neither pretend nor can be expected to have any clear knowledge of the species which may be offered for sale.

Notes on Cultivated Conifers.—IX.

MOST of the Pines with thickened cone-scales and coarse-grained resinous wood produce their leaves in clusters of two or of three with persistent sheaths. There is, however, a small group of this section with leaves in from one to five leaved clusters and deciduous sheaths, and to this belong the so-called Nut Pines or Piñons of the arid regions of the south-western United States, northern Mexico and Lower California. There are four of these Nut Pines, all inhabitants of the United States and all small, round-topped trees, with rigid spinescent leaves, small globose cones of few scales and large edible seeds, which furnish to some of the desert Indians their principal supply of food; and they all grow in company with desert Junipers in regions too dry for other trees. Two of the Nut Pines,

Pinus monophylla of the deserts between the Rocky Mountains and the Sierra Nevada, and Pinus edulis of Colorado, Utah, New Mexico and Arizona, live in the eastern states, but grow here very slowly, giving little promise of ever emerging from their strictly pyramidal juvenile form or of producing cones. The former is interesting morphologically, as it is the only Pine-tree (with the exception of a monstrous seminal form of the European Pinus sylvestris) with leaves which generally appear solitary by the very early suppression in the bud of one leaf of a two-leaved cluster.

In this group, too, may be placed two alpine Pine-trees of western North America, with leaves in five-leaved clusters crowded round the ends of the branches in dense brushes, and fitly called Foxtail Pines by the miners, who often use their short stout trunks for props in the mines. The first of these trees, Pinus Balfouriana, from northern California, has probably not been tried in the eastern states, but the other, Pinus aristata, which is widely scattered at high elevations from the outer range of the Rocky Mountains of Colorado to the southern Sierra Nevada and to the San Francisco Peaks in northern Arizona, was raised in 1862 by Dr. Asa Gray in the Harvard Botanic Garden from seeds collected by Dr. Parry on Pike's Peak. A few of these plants are still left in the neighborhood of Boston, and now at the end of thirty-five years are from twelve to eighteen inches in height and interesting only in the evidence which they afford of a remarkable tenacity of life under adverse conditions.

In the group of Pine-trees with leaves in clusters of three are some of the most important timber-trees of the whole genus, like Pinus palustris, the southern Pitch Pine, the most valuable of all the Pines, Pinus Taeda, the Loblolly Pine of the southern states, and several Mexican, Californian and Indian species. None of these, however, is hardy in the northern states, where only a few of the three-leaved Pines can be successfully cultivated. The best-known here is the native Pitch Pine (Pinus rigida), which is widely scattered from New Brunswick and the northern shores of Lake Ontario to northern Georgia, and from the seacoast to the western slopes of the Appalachian Mountains. This tree is valuable because it can be raised more quickly and cheaply in the northern states than any other conifer from seeds scattered broadcast on the ground or sowed in shallow drills; and no other conifer grows here so rapidly on dry sterile gravels, which it soon covers with dense forests. It is often valuable, too, where the soil is poor, as an ornamental tree, and in old age it frequently becomes extremely picturesque with its dark red-brown roughened and deeply fissured bark, contorted branches and sparse dark yellow-green rigid leaves which stand out stiffly from the branchlets. To this section of the genus also belongs Pinus ponderosa, one of the largest and most majestic of all Pine-trees, and one of the most widely distributed and variable of the North American species. As a rule, Pinus ponderosa and its varieties have not proved satisfactory in the eastern states. The long-leaved California forms are not hardy in New England, although I have seen in the Hudson River valley two or three healthy specimens from thirty to forty years planted. The form of the interior of the continent (var. scopulorum) with short leaves in two and in three leaved clusters and small cones is hardy in the neighborhood of Boston, where it is impossible, however, to keep it alive more than a few years at a time, owing to a fungal disease which disfigures and soon destroys it. The variety Jeffreyi (the Pinus Jeffreyi of many authors), a large tree of the dry parts of northern and eastern California, with long blue-green leaves and large cones, is more successful here, although healthy plants are not common. This tree appears quite hardy in the neighborhood of Boston, but the best specimens probably in the eastern states are in Delaware Park, Buffalo, where eight trees planted in 1871 vary in height from twenty-five to thirty-seven feet, with stems measured at one foot above the ground varying from one foot nine inches to three feet nine inches in circumference. There are two healthy plants of this variety, also, about twenty-five feet in height, in Central Park, New York, near the greenhouses on the east drive. This handsome and distinct tree can therefore, perhaps, be used here more freely than it has been, although like the green-leaved forms, it will probably always suffer more or less from fungi.

The only other Pine with leaves in clusters of three which we can hope to see established in our northern gardens is the north China Lace Bark Pine (Pinus Bungeana), a tree with a stout trunk divided not far above the ground into several upright secondary stems, smooth pale bark separating freely into thin scales like those of a Birch or an Arbutus, and stiff rigid yellow-green leaves. This tree is very hardy in eastern Massachusetts, where, although still retaining a bushy habit, it produces fertile cones in abundance. Probably the largest and handsomest specimen of the Lace Bark Pine in the eastern states is in Mr. Josiah Hoopes's pinetum at West Chester, Pennsylvania (see Garden and Forest, vol. vi., p. 458).

Among the Pines with leaves in clusters of two there are a number of species which are hardy in the northern states and among them are a few good park trees. The most valuable for our plantations is the Red or Norway Pine (Pinus resinosa). This is a tree of the far north, ranging southward only to eastern Massachusetts, where it occurs in a few small isolated groves, the mountains of Pennsylvania, and central Michigan, Wisconsin and Minnesota. In its best state the Red Pine is a tall-stemmed tree one hundred and fifty feet in height, with a trunk five feet in diameter, although more usually it does not attain much more than half that size. In the beauty of its long dark green, lustrous leaves and light red bark, and in its rapid growth it excels all the Pitch Pines which are hardy here, although a climate colder even than that of eastern Massachusetts is required to develop all its beauty. Botanically this tree is interesting as the only American representative of a peculiar Old World group of species of which the so-called Scotch or Rega Pine (Pinus sylvestris) is the best known in this country. This is the great timber Pine of Europe, where it is widely spread over the continent and over Russian Asia, often forming vast forests on sandy northern plains. Grown under the best conditions in its native countries, Pinus sylvestris, with its tall trunk covered with light red bark and picturesque crown of short and often contorted branches clothed with pale blue-green leaves, is one of the handsomest of the Pines. It was introduced into the United States early in the present century, and, unfortunately, nurserymen have found it a profitable tree to raise. Its value, like that of a good many other foreign trees which can be easily and quickly grown in nurseries to markable size, has been extolled far and wide, and it has been largely planted all over the northern states as an ornamental tree and to form wind-breaks on the prairies and plains of the central west. Experience has shown, however, that although Pinus sylvestris grows in America while young with great rapidity, producing seedlings spontaneously, it soon dies from the attacks of disease and boring insects, so that trees more than thirty or forty years old are rare in this country. In European nurseries a number of monstrous forms are propagated; the most distinct of these is the variety pumila, a small compact shrub, the variety fastigiata, with erect branches, and the variety monophylla on which the leaves are solitary. There are also cultivated forms with leaves marked more or less conspicuously with white and with yellow, and others with pendant branches or otherwise different from the normal in slight peculiarities.

The Austrian Pine, which is now generally considered a variety of the Pinus Laricio of southern Europe, has also been largely planted in the northern states as an ornamental tree. It grows here very rapidly, and, although less beautiful than the native Red Pine, in youth it is a handsome tree of good habit and rapid growth with long dark green rigid leaves. Easy to raise, the Austrian Pine, like the Scotch Pine, has been too much praised by Ameri-

can nurserymen, who find quicker profits in growing these European Pines than they do in raising the native White and Red Pines, for the Austrian Pine, although it lasts some time in good condition rather longer than the Scotch Pine, generally succumbs to the attacks of boring insects before it has lost its bushy juvenile habit, and an Austrian Pine in the United States more than fifty feet high is exceptional. The more slender-leaved Corsican Pine, the typical Pinus Laricio, is a handsomer tree, which has not proved hardy in New England. It may be occasionally seen in the middle states, but there is no evidence, however, in large or old specimens that this tree will really become a valuable acquisition for American plantations.

Pinus montana, also known in its different forms as Pinus Mugho, P. uncinata and P. Pumilio, is a subalpine plant of the mountains of central Europe, where it grows at elevations between 4,000 and 7,500 feet above the sea-level. Sometimes rising into a small tree, the Mountain Pine is more often shrubby in habit, with many stems decumbent below and erect above, forming broad clumps generally five or six feet in height and densely clothed with stout, rigid, dark green leaves. This plant is usually more successful in the northern states than the other European Pines; very hardy and comparatively free from the attacks of disease and insects, it is often useful for the decoration of rocky banks and knolls.

Of the value of the two eastern Asiatic two-leaved Pines introduced into this country it is too soon to speak, as they have been grown here for only twenty-five or thirty years. The first of these trees, Pinus Thunbergii, the Kura-matsu or Black Pine of Japan, inhabits northern China and Corea, and is extensively cultivated in Japan, where it is probably not indigenous. It is a tree sometimes eighty feet in height, with a trunk three feet in diameter and a broad head of stout, contorted and often pendulous branches, stout dark green leaves not unlike those of the Austrian Pine, and conspicuously white branch-buds. This is a favorite tree with the Japanese, who plant it on sandy coast plains and along the borders of their principal highroads. It is also used to cover arbors and to hang over the sides of moated walls, and is seen in every garden, where it is frequently dwarfed and trained into fantastic shapes. Pinus Thunbergii is perfectly hardy in New England. The Aka-matsu, or Red Pine of Japan (Pinus densiflora), is common in the mountain forests of the central part of the empire, and is seventy or eighty feet in height, with a slender trunk covered with light red scaly bark and thin light green leaves. Although an exceedingly picturesque and beautiful tree, it is rarely used by the Japanese as an ornamental plant, although it is a common inhabitant of their artificial forests. This tree, which often appears in our gardens under the name of Pinus Massoniana, a name which belongs to a south China species, is hardy in New England, where it produces fertile cones in profusion and is already beginning to assume its mature picturesque habit. So far as can be judged by an experience of twenty-five years, this appears to be the most promising of the two-leaved Pines introduced into the eastern states from foreign countries.

Other two-leaved Pines which are perfectly hardy in the northern states are Pinus Virginiana, better known, perhaps, as Pinus inops, the Jersey or Scrub Pine, Pinus pungens, the Table Mountain Pine, Pinus echinata (or mitis) and Pinus divaricata (or Banksiana). These are all eastern American species of no particular ornamental value. The least attractive of them, perhaps, is Pinus Virginiana, an inhabitant of the middle Atlantic states, and perfectly hardy in eastern Massachusetts. Scrubby generally in appearance, it is a valuable tree in its ability to cover rapidly sterile and worn-out soils in the middle Atlantic states. Pinus pungens, usually called the Table Mountain Pine from a locality where it grows in Pennsylvania, is an Appalachian species which naturally does not grow north of Pennsylvania. It is very hardy in New England, but has little to recommend it as an ornamental tree but its large, massive, abundant cones. Pinus echinata, the short-leaved Yellow Pine of the south, is one of the most valuable of all timber Pines, supplying from the pineries of the upper districts of the southern states, and of Arkansas immense quantities of valuable lumber. It finds on the Atlantic coast its most northerly home on Staten Island, New York. This noble tree exists in the Arnold Arboretum, but evidently is not yet at home here. Pinus divaricata, which is the most boreal of the Pine-trees of eastern America, although it attains its greatest size and beauty only in far northern regions, flourishes in eastern Massachusetts, and is always interesting, if not beautiful, with its short, stout, falcate leaves spreading from the base, and erect cones incurved to the branches.

The Lodge Pole Pine (Pinus contorta, var. Murrayana), which grows over all the mountain ranges of the northwestern and central mountain regions of the continent, and is the most widely distributed of the North American Pines, is chiefly interesting in the power of its seeds, securely guarded in tightly closed cones until fire releases them, to germinate on burnt soil. Thanks to this power, the Lodge Pole Pine has been able, not only to maintain itself against the inroads of fire, but to increase the area of its possession until it seems destined to become in the future the sole inhabitant of western forests. Introduced from Colorado into the Arnold Arboretum about twenty years ago, the Lodge Pole Pine has proved hardy and produced its cones here, but, like other dry country conifers, it suffers from fungal diseases and gives no promise of permanent success.

C. S. S.

Autumn Fruits in the Pines.

As autumn advances in the Pines the fruits are continually disclosed, and show a wealth of color only equaled by the many-hued leaves of the trees and shrubs. The bright scarlet-red fruit of Ilex verticillata is to be seen everywhere in the low thickets, and of I. lævigata also, though it is less common. The fruit of the latter species ripens before that of I. verticillata, and is also larger and more scattered on the limbs and twigs. The foliage is still green on both species, and the showy berries are specially beautiful among the leaves. The Ink Berry (I. glabra) with evergreen leaves and black fruit, is abundant in all damp places in the Pines. Our American Holly (I. opaca) is unusually attractive this fall. The berries are not as brilliant as those of the deciduous members of the genus, but the handsome foliage, which remains as long as the fruit, more than compensates for the less vivid color.

Magnolia glauca is one of our best and most abundant trees. It is almost an evergreen in the Pines, and young trees especially hold their leaves until late spring. Its handsome cone-like red fruit has appeared all summer long and still shows here and there among the large, shining dark green leaves. The Flowering Dogwood, too, is yet holding its clusters of bright red drupes, more attractive even than its showy flowers. A wealth of Rose hips decorate the low bushes along country roadsides and in out-of-the-way places, and in the damp Pines the tall Swamp Rose (Rosa Carolina) reaches above our heads and is thickly set with its flattened globular fruits. One form of Pyrus arbutifolia has red berries, which it still retains, and these will provide winter feasts for the birds. The orange-colored pods of the Bittersweet (Celastrus scandens) are now opening, and disclose the bright scarlet seeds. A few years ago Smilax Walteri could have been seen here with its red fruits, but it has disappeared from this locality and its former home is now occupied by cultivated plants.

Among handsome trailing vines seen here, which bear bright fruits now, is the Cranberry (Vaccinium macrocarpon). Among the clean, damp sphagnum it sometimes has berries of the deepest crimson, while others are light red, and some are white on one side and deep pink on the other. Long stems bearing this multicolored fruit are sin-

gularly ornamental when mingled with the glossy leaves of neighboring low shrubs. Here and there we find dense patches of the creeping Partridge Berry (Mitchella repens) with small, round leaves strung along the stem in pairs, interspersed with the scarlet double berries. Both leaves and fruit remain fresh and bright all winter long. The Creeping Wintergreen (Gaultheria procumbens) with its red aromatic fruits and shining fragrant leaves, is common in the damp Pines.

Not only red fruits abound at this time, but many others of less conspicuous color, though equally handsome, are found in the Pines. The fruit of the Bayberry (Myrica Caroliniensis) covered with white wax and mingled with its fragrant leaves, is ornamental and pleasant to handle. These dry, waxy nuts are a favorite food of birds at this season. In my wild garden there are several groups of these shrubs, the stems of which early in autumn were almost covered with the white drupes. But the birds settled on the bushes in flocks and stripped them clean, not leaving a berry; the fragrant leaves will remain all winter.

The berry-like blue fruit of the White Cedar (Cupressus thyoides) is also ornamental. Its sweet pleasant taste attracts robins, bluebirds and cedar birds, which often eat all the fruit on a tree before cold weather sets in. The black fruit of Smilax Bona-nox is quite effective mingled with its shining green leaves, and so is the fruit and foliage of several other species of this neglected genus.

The Fringe-tree (Chionanthus Virginica) has small olive-like fruits which remain green most of the summer, and take on a purple hue late in the season. These remain in autumn until the birds take them, but they are less greedily eaten than many other fruits. The Virginia Creeper has been beautiful all through the fall with its crimson foliage and clusters of bluish black berries, which the birds specially like. The Common Tupelo (Nyssa sylvatica) is still magnificent with bright crimson leaves and oval bluish fruit in clusters on the end of a slender stem. The Frost Grapes are highly ornamental in the right place. The leaves have a delicate texture and are deeply lobed and bright green on both upper and lower surfaces.

The fruits of some of the Persimmon-trees in the Pines ripen in September and October, and are excellent, with no astringent taste. On most of the trees the fruit is not edible until after exposure to sharp frost, and even then it is not so pleasant tasting as the earlier fruits. It is remarkable that this common Persimmon (Diospyros Virginiana) is not cultivated, for the tree and foliage are both handsome, and the fruit delicious.

The Pokeweed, which grows everywhere, can be made a most striking and effective decorative plant. With care and rich soil it will attain a height of ten feet or more. Its red stem and fine large leaves, exempt from insect depredators, are ornamental, and its long racemes of white flowers with ten stamens and ten styles are more handsome than many exotic plants which are given a place in our gardens. The blossoms appear all summer long until sharp frosts cut them off; and the racemes of rich purple berries are also handsome. Any one who cares to study the ways of birds will welcome a thriving plant of Pokeweed near his window. The birds are specially fond of the fruit, and in no way can one more readily note the behavior of the different birds than here. The bluebird has delicate manners when he dines; he is deliberate and dainty, taking a berry and then pausing and making some comment to his mate or children. The family remains united throughout the autumn and takes its meals together. The catbird has quick, jerky movements and eats more rapidly than the bluebird, but not so greedily as the robin, who gorges, and then stretches himself up in a pompous way, his red breast dyed with the purple juice. After looking about a few moments he hurriedly takes more, and only leaves the berries to go to the lawn with his head to one side, as he listens for earth-worms or white grubs, which he pulls from among the grass-roots.

Vineland, N. J. *Mary Treat.*

New or Little-known Plants.

Alnus tinctoria.

UNDER this name an Alder was sent several years ago to the Arnold Arboretum by Mr. Veitch, who probably had raised it from seeds collected in Japan by Maries, as I have seen the same tree in Yezo, and the plants raised from seeds which I brought from that island five years ago are identical with Veitch's Alnus tinctoria, a name which, although it has been more or less used in gardens, appears to be still unpublished. On the island of Yezo this Alder is a shapely tree from fifty to sixty feet in height, with a trunk often two feet in diameter, growing there on low slopes in rich moist ground, usually at some distance from the banks of streams, which are generally occupied in southern Yezo by Alnus Japonica. It has been considered by the Japanese botanists Spach's variety hirsuta of Alnus incana, of Manchuria and Siberia, and it is possible that this view is correct, although, for lack of proper material, representing the different species and varieties of Asiatic Alders in American herbaria, it is impossible to form a correct idea on this subject, and the object of this note, and of the figure on page 473 of this issue, made from specimens gathered in Yezo, is to call attention to a promising ornamental tree.

The leaves of this Alder, which, until something more is known of the Manchurian species, had perhaps best be called Alnus tinctoria, are oblong, obtusely wedge-shaped at the base, coarsely doubly serrate, or often incisely lobed above the middle, and clothed below with soft, close, rufous pubescence, which also covers the upper side of the slender midrids and primary veins; they are thin and membranaceous, from four to six inches long and from three and a half to five inches broad, dark green above, pale below, and are borne on stout petioles an inch and a half in length. The flowers I have not seen, but the buds of the staminate catkins are an inch and a half long and a third of an inch broad, and are borne on stout peduncles from one-third to one-half of an inch in length. The fruit is half an inch long and about a third of an inch thick, so that the leaves, the buds of the staminate catkins and the fruits are much larger than those of any of the European or North American forms of Alnus incana. The stout, somewhat flattened branchlets marked by only occasional pale lenticels and covered during the winter by a glaucous bloom, and the much larger bright purple-red winter buds, appear very distinct from those of Alnus incana.

Several of the plants raised from seeds which I brought from Japan in 1892 are now twelve feet high, with perfectly straight stems from five to six inches in diameter at the base and furnished with well-balanced, vigorous branches. Shapely and handsome now, they look as if they would grow here to a large size and prove valuable ornamental trees. *C. S. S.*

Foreign Correspondence.

Chrysanthemums.

THE annual exhibition arranged by the National Chrysanthemum Society was held this week in the Royal Aquarium, Westminster, and was open three days. In the extent of the collections and quality of the flowers it was considered to be the best exhibition ever held in London, or, indeed, anywhere else. Years ago specimen plants were the principal feature of this and similar exhibitions, but now it is almost entirely a display of cut flowers arranged either on trays, in vases, or in various floral decorations, such as crosses, wreaths, etc. I noted last year the extraordinary progress made in the Japanese section compared with the other sections, and this year the popularity of this big fantastic-flowered section is greatly emphasized. Thus, of cut flowers shown for prizes there were over one thousand blooms of Japanese varieties staged, whereas the

Incurved section numbered less than five hundred, while all the other sections together would not exceed the latter number. When it is borne in mind that the flowers of the Japanese section are from eight inches to a foot in diameter, the display a thousand blooms would make can readily be imagined. And these figures do not include the large collections of blooms shown in groups by trade growers. The crowd was always thickest in front of the stages where the Japanese flowers were, and the conversation of the thousands who visited the exhibition was generally directed to the enormous size, colors and other attractions of the flowers of this section.

While many of the old favorite varieties held prominent positions among the most successful exhibits, there were

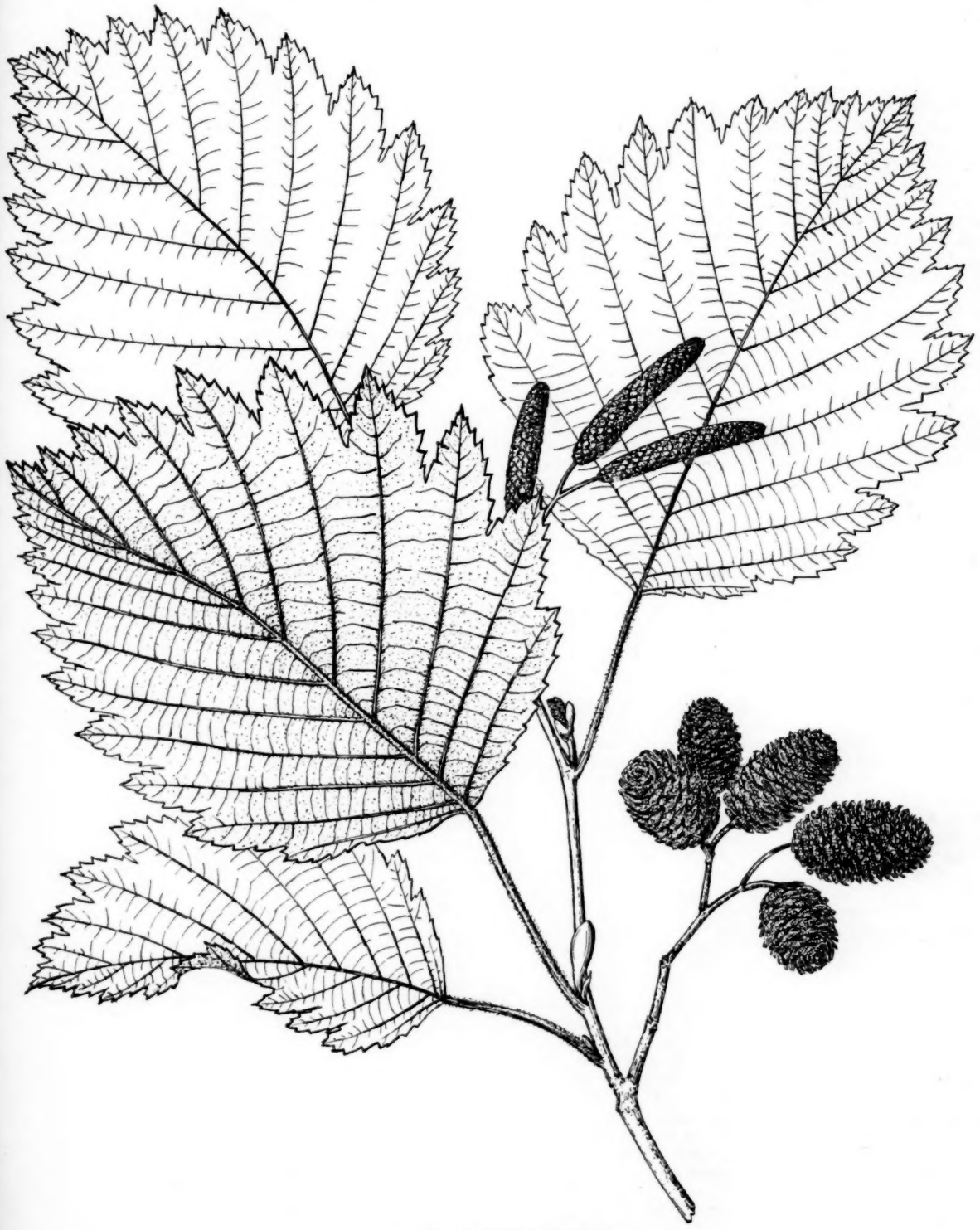

Fig. 59.—Alnus tinctoria.—See page 472.

many new varieties also, and some of them were voted the highest honors. A list of the varieties which comprised the premier collection of forty-eight cut blooms of the Japanese section comprises Madame Carnot, Etoile de Lyon, Mrs. W. H. Lees, Monsieur de la Rocheterie, Baronne Ad. de Rothschild, J. Brooks, Mrs. C. H. Payne, Viviand Morel, Monsieur Panckoucke, Eva Knowles, Pride of Exmouth, A. H. Wood, Lady Hanham, Simplicity, Australie, Yellow Madame Carnot, Phœbus, Mrs. Dewar, Julie Scaramanza, Mutual Friend, Mrs. G. Carpenter, Monsieur Hoste, Charles Davis, Mrs. Charles Blick, Monsieur Chenon de Leché, Australian Gold, E. Molyneux, Mrs. J. Lewis, Monsieur Gruyer, Edith Tabor, Monsieur Hoste, Lady Ridgway, Mrs. Weeks, Monsieur Ch. Molin, Colonel Chase, Sunstone, Mademoiselle M. A. de Galbert, Modesto, Madame M. Ricoud, Baron Tait, Niveus, Mrs. Briscoe-Ironside, Madame Gustave Henry, N. C. S. Jubilee, Miss Elsie Teichmann, Robert Powell, Robert Owen and Viscountess Hambledon. This collection was shown by Mr. W. Mease, gardener to A. Tate, Esq., Leatherhead, one of the most successful growers and exhibitors of Chrysanthemums. The prize for six blooms of a white Japanese variety was awarded to magnificent flowers of Madame Carnot; Mrs. C. Blick being second and Madame Carnot again third. The yellow sport of Madame Carnot, called J. G. Warren, was awarded the medal for the best flower of a Japanese variety in the whole exhibition. In the class for six flowers of a Japanese-colored variety, Phœbus (yellow) was an easy first, Edith Tabor (yellow) being second and E. Molyneux (crimson and gold) third. Other Japanese varieties which were of marked excellence were Western King (white), Hairy Wonder, Elsie Teichmann and Australian Gold. The feature of the whole exhibition, however, was Madame Carnot, which was prominent in every collection, and also figured largely in the groups, fifty magnificent blooms of it being conspicuous in a most artistically arranged group of cut flowers in vases shown by Mr. Norman Davis.

The Incurved section, although eclipsed by its larger-flowered, less formal sister, was represented by some beautiful flowers. The magnificent yellow, Charles H. Curtis, was by far the best of the varieties shown, while the white Madame Ferlat, the purple Miss Dorothy Foster and the blush-white Lady Isobel were worthy companions. The premier collection of thirty-six blooms was shown by Mr. Mease and comprised the following: Duchess of Fife, Violet Foster, J. Agate, Dorothy Foster, Major Bonnaffon, Mrs. R. C. Kingston, William Tunnington, Lord Alcester, Lady Isobel, Robert Petfield, Charles H. Curtis, Ma Perfection, John Doughty, Empress of India, Lucy Kendall, M. P. Martignac, Queen of England, Violet Tomlin, John Lambert, Lord Rosebery, Golden Empress, Globe d'Or, Jeanne d'Arc, Robert Cannell, Princess of Wales, Brookleigh Gem, Empress Eugénie, George Haigh, Bonnie Dundee, Noel Pragnell, Princess Beatrice, Mrs. Hepper, Alfred Salter, Mrs. Heale, C. B. Whitnall and Miss Haggas.

The best collection of twelve varieties of the Anemone-flowered section comprised Mr. H. Gardiner, Sir Walter Raleigh, Robin Adair, Mademoiselle Cabrol, Queen Elizabeth, Nelson, Caledonia, Owen's Perfection, John Bunyan, W. L. Astor, Enterprise and Reiche Lyonnaise. Although wanting, perhaps, in those characters which make the Japanese varieties so popular, yet I consider that these Anemone-flowered sorts are the most remarkable of all the races developed from the wild Chrysanthemum, the central florets in many of them being like a compact cluster of the flowers of an Erica, such as E. hyemalis, surrounded by a ruff or collar of ray-florets.

The Hairy Chrysanthemums are growing in favor here, the best of the varieties raised so far, namely, Hairy Wonder, being shown in fine form in several collections of cut blooms. Other varieties shown were Princess Ena, Mrs. Godfrey, White Swan, Mrs. Dr. Ward and Vaucanson.

The single-flowered varieties have many admirers since the introduction of Mary Anderson and Jane, two of the most beautiful of all Chrysanthemums for pot specimens. I noted the following among the cut flowers shown: Lady Churchill, quilled, brick-red and gold; Evan Cameron, white; Miss Braithwaite, deep crimson, six inches across; Mrs. B. Ware, yellow, with drooping florets; Oceania, pale blush-pink; Rev. Rambrey, crimson; A. T. Simmons, yellow. If I had to be limited to the cultivation of three Chrysanthemums I should ask for Mary Anderson to be one of them. It is charming with us this year both in the conservatory and in the open borders, where now (November 12th) it is crowded with flowers.

Specimen plants were represented by only a small number of examples, which, however, were excellent in their way, enormous half-globes or standards, with the flowers all spaced out equally and staked or wired separately. The best of them was a gigantic semiglobular plant of Colonel W. B. Smith bearing over fifty flowers, every one of which was almost good enough for the exhibition table. Madame Carnot, Gloriosum, John Shrimpton and Florence Percy were also represented by big well-flowered specimens.

Exhibitors, in London at any rate, have yet to learn how to appreciate the Chrysanthemum when grown in a more natural way. The big flowers necessary to win prizes when shown singly on trays are wonderful examples of the cultivator's art, but such flowers can only be grown at the expense of the natural beauty of the plant, which, in fact, is often made to concentrate all its energies on the production of one bloom. There is also a danger of breeders neglecting altogether the habit and leaf characters of the plant in their pursuit of the big exhibition bloom. Many of these big-flowered varieties are worthless when grown as bushes to produce a dozen or so of flowers. We want bushy Chrysanthemums for the decoration of the conservatory rather than the long-legged, one-flowered monstrosities such as one sees in the gardens of those cultivators who grow chiefly for exhibition. The thousands who now grow the Chrysanthemum, from the royal gardener to the poorest cottager, prefer a plant that is a picture as a whole rather than one that is remarkable only for the enormous size of its flower when grown on the "extension" system. However, we have plenty of varieties, old though most of them are, which serve the former purpose admirably. As *The Gardeners' Chronicle* remarks: "It seems but a few years since the first really good exhibition was held or since breeders' attempts to produce larger and more attractive flowers. But the work has gone on apace, the strides have been rapid and every one is astonished at the result."

London. *W. Watson.*

Cultural Department.

Greenhouse Cultivation for Amateurs.

GARDENING, with a general collection of plants in the open and under glass, is a rather continuous experience, but when the days are shortened, the outdoor labors are past and the greenhouse made ready for a new season, there is a comparatively care-free time of a few weeks—for the amateur, at least. It is well to recognize at this season, that plants, as well as man, appreciate a rest, and patience, rather than haste, is now the proper state of mind in the matter of greenhouse treatment. Surplus artificial heat with forced growth under the present lowering skies is sure to result in weak plants with a prison-like pallor, for which a few extra flowers are no compensation, not to say anything of insects, which are sure to riot on the weaklings later.

It will suffice to define my greenhouse operations as strictly amateurish if I record that now, on November 15th, there is no fire-heat in the house. The stove has been lighted a few times, but not enough heat has yet been applied to make the plants at all tender or liable to injury by draughts of cold air. Of course, this season has been exceptionally warm, but my usual practice is to avoid all artificial heat until I am forced to start it, and wait with more or less patience for clearer skies and settled weather which midwinter is sure to bring. Like all small greenhouses, mine warms up too rapidly and cools off as suddenly; but this is a detail without serious effect on plants. No place in the world has a really constant temperature, and the insistance on fixed temperatures for plants under

cultivation is somewhat misleading. Too many flower fanciers and owners of small gardens are deterred from having a small greenhouse by the fancied expense and the supposed difficulty of growing plants under glass, this latter idea being formed from reading long detailed cultural directions for plants often grown as easily as Beans. The practical fact is, as the least reflection will show, plants under glass should be as easily and successfully cultivated as those grown in the open. Each kind of gardening has its problems. The average plant cultivated in the garden will grow fairly well without much attention, but there are numerous species which test all one's skill and patience, and are almost impossible to cultivate successfully under the unnatural conditions which prevail in the ordinary garden. In the greenhouse the problems are different, but the conditions are very much under the control of the cultivator, and any one who understands plant-growth should have fewer failures indoors than outside. Plenty of good fresh air properly warmed and a judicious use of the watering-pot are the first simple requisites to successful cultivation of plants under glass. A man whose plants are in such condition that when the ventilators are open they become covered with mildew, or when closed are infested with a crop of thrips, is outside his vocation.

Commercial flower growers force their plants and grow them at high pressure, with the one object of securing a crop. Generally they succeed, but the plants are exhausted, and it is a constant struggle with most unnatural conditions, and not a practice to be followed by the amateur, to whom individual plants are valuable, if common, and to whom repose and pleasure are somewhat synonymous. What an amateur will grow in his greenhouse is as often a matter of chance as of taste, and usually three or four times as much is grown as the house will comfortably hold. In all large towns nowadays the florists' flowers, as roses and carnations, are plentiful, and it does not seem worth while to give up the greenhouse to these. Usually it will be found most satisfactory to grow rather unusual plants or those not seen in the shops, and supplement the ordinary contents of the home with potted Dutch bulbs, to be brought in during the winter.

Insects are always with us, but they affect some plants more than others. It is scarcely ever worth while to continue to grow a plant that persistently collects most of the insects in the house, as some plants will. Palms are the only insect accumulators which I tolerate. My list of plants is apt to change from year to year, but at present there is a bench of Orchids, and some of these plants suspended; a lot of miscellaneous plants, including Begonias, Palms, Crotons, Eucharis, Griffinias, Irises, Cacti, Sedums, Marantas, to mention a few which occur to me; a few climbers; a bed of Ferns and one of Violets; and a lot of odd bulbous plants in various states of activity.

Not all the plants in this collection kept under one roof will grow into specimen plants; but they will serve to help the winter pass so pleasantly that I feel impelled to urge all amateurs to provide themselves with some structure fairly well adapted for plant-growth in winter, so that it is well lighted and properly heated. Without these conditions the cultivation of plants in winter does not seem worth the struggle. A conservatory kept cold, clammy and stagnant because there is no heat to use in keeping pure air in circulation is a most depressing example of what to avoid.

Elizabeth, N. J. *J. N. Gerard.*

Autumn Protection.

TO the possessor of a garden autumn is almost as busy a time as spring, though the work is different and not so interesting. All planting should be finished by the first of November, as there is not time enough thereafter for newly-planted subjects to get established before cold weather, and there would thus be no reserve force for the plants to draw on during winter. After that date it is better to postpone planting until spring, or if plants arrive late, to store them in a cellar or other suitable place until spring.

In the garden many plants that are classed as hardy are not trustworthy in this respect. They may pass through a season or two without damage, but will be injured or killed in an unusually severe winter, or a normal winter after a wet and sunless autumn. The past two months have been favorable to the ripening off of growth made during the past summer; this is fortunate for the plants, for if the autumn had been sunless many plants would have been killed this winter.

If there is any doubt about Evergreens, Rhododendrons especially, we always protect them by placing Pine or Spruce boughs between the plants. Formerly we covered the plants with a thatched roof of branches, but they are now too high to protect in this way. We find that if the branches are disposed through them so as to ward off the sun's rays in the early spring months scorching is prevented. The boughs should remain until after the first hot days in April, which most cultivators agree is the critical period. We bank two feet of dry forest leaves about the roots of the Rhododendrons early in November or before that time. These are not removed in spring, and the vigor the plants have taken on under this treatment is surprising. They act as a mulch to keep the soil moist. They are eventually taken down by the earthworms, and are just the kind of food that is good for the plants.

Hardy plant borders have now been trimmed of all the top growth, and this is the time to make preparations for vigorous growth next year if the soil needs replenishing. Last fall our borders were covered with about six inches of leaf-mold, as this material was at hand. It was left on this summer, and every plant came up through it with a surprising vigor. Two seasons are necessary for leaf-soil to become properly decomposed; the decomposition may be hastened by the addition of lime, but it would not then be available for use indoors for Ericaceous plants, or for Rhododendrons in the border, as lime is fatal to all plants of this order, and, in fact, to all that have fine hair-like roots. In the absence of leaf-soil, well-rotted manure may be safely used on borders; in gardens this is almost as scarce an article as leaf-mold, as it is generally desirable to use it before it reaches the stage of mere decomposed vegetable matter; but the use of any but old well-decayed material is not desirable.

It has been generally supposed that Lilies dislike manure in the soil, and these plants are often almost starved. It is true that manure should not be placed near the bulbs, as it often causes decay. This is especially true of newly-planted bulbs; these are sometimes bruised, and the elements of decay are present, and with but little encouragement become fatal. In the case of established bulbs, however, it is necessary to provide a rich stimulant to bring them into luxuriant flowering. If this is applied now as a top-dressing the improvement will be marked next year, and the application is likely to be made annually. Lily-of-the-valley beds are also now given their usual winter covering, preferably of leaf-soil. I find that a destructive fungus is likely to attack these bulbs if manure is used. A long succession of these flowers may be had out-of-doors by carefully arranging the beds with regard to exposure to the sun in spring, and by regulating the covering. We had good flowers last summer a month after the first came in, from a planting under the shade of Pine-trees, where the frost did not thaw out until late. Lily-of-the-valley is one of the few subjects that will thrive admirably under Pine-trees; I have seen them growing wild in such a location.

If Narcissus are grown by themselves in a separate border it is necessary to give them a good protective mulch. It will be found that the young shoots are well started already, and if as sometimes happens, snow and frost come late, they will even appear above the ground and be hurt when cold weather sets in, or late in spring before the arrival of genial weather. If they are covered now this will serve also as a fertilizer in spring, and will serve also to nourish the crop of annuals which will follow the Narcissus for a late summer display. Last season we planted Gladioli between the rows of Narcissus; this was even more satisfactory than Asters, or annuals which cover the ground more.

Coniferous trees and shrubs, such as the Retinosporas, Juniperus, Thuyopsis dolobrata and the Golden Yew need protection from the sun. We find these perfectly hardy in the most exposed situations if they are sheltered from the hot sun when frozen. Young trees of Sciadopitys and the Nordmann Fir are also apt to suffer from this cause. The latter will lose its leader year after year when young if not protected, and the Japanese Silver Fir (Abies firma) is sure to be hurt in a sunny exposure. The branches of Norway Spruces are useful as a screen and save choice trees from damage; these must be firmly placed in the soil about the tree before the ground is frozen or the storms will displace them.

Young Magnolias that have been set out recently ought to be given some shelter for a year or two. We lost almost the whole of a collection two winters ago. Well-established trees were killed to the ground in some cases, and the strong shoots now sent up are even more liable to injury. Magnolias, which are so beautiful and so hard to get established, should have shelter for a year or two after planting.

Hardy Roses are so called, we presume, because they do not die off at once the first winter. We find that a very short list will include all that are iron-clad, but the lives of Roses can be prolonged if the earth is drawn up about them at least

a foot high. This banking will also attract the snow and thus be a help. Roses are quite apt to die to the ground if they are unprotected; if straw litter is used it will attract the field mice and these are worse even than frost, for they usually girdle the plants down to the ground-level.

A garden would lose half its charm were not these precautionary measures needed. They keep us interested in the well-being of the plants, and protective measures are never lost labor. It is better to be safe than regretful, and this is the time to get on the safe side.

South Lancaster, Mass. *E. O. Orpet.*

Wintering Bedding Stock.

BEDDING Stock has little decorative value at this season, and it is often a problem how to care for it without taking up too much useful space. In some instances we must propagate in the autumn to the full extent of next season's requirements. All the tricolor, as well as many bronzy-leaved Geraniums, are of slow growth, and it requires care and work to make good plants from cuttings taken in the autumn. Nierembergia frutescens, an uncommon but graceful little plant which gives an abundance of pale blue, saucer-shaped flowers throughout the summer, should be grown along through the winter to get good plants, and this is the case with the dwarf yellow and purple Lantanas. We take up the old plants; in time they make neat bushes and standards of these plants are a most attractive feature in the flower garden at Wellesley. The yellow variety with an undergrowth of Nierembergia, or dwarf Lobelia, makes an effective bed.

Plants used for subtropical effects must either be held over or propagated early to get plants large enough by planting-time. Those which need a resting season, as well as others which make little growth, can be stored in cool houses or fairly light pits. These include Grevilleas, Coprosmas, Dracænas, Lantanas, Acacias and Australian Dracænas. Abutilons are less hardy and need a more genial temperature. For a succession we start seeds of Dracænas, Grevilleas and Eucalyptus after the days begin to lengthen, and put in cuttings of the other sorts. A few old plants of Salvias give us all the cuttings we need. It is not necessary to take up more room with them until spring-time, as cuttings root quickly and soon make good plants. With the common tall Salvia splendens we would not even take cuttings, as it is more convenient to propagate from seed, but we have a selected dwarf variety which has proved to be uncertain from seeds. Common bedding Geraniums are stowed away on shelves overhead, but not more than half of the number we need are put in, as we take the tops again in February. A very few Coleus are required to give an abundant supply of plants. Cuttings taken in the autumn are preferred to old plants, for the latter are liable to be infested with mealy bug. But by taking the tips only of plants free from insects we keep our stock clean. A few plants of Alyssum Little Gem will give plenty of cuttings, but these must be started at once to get a good stock of fair-sized plants. Different methods are employed to propagate these plants. Some cultivators take up old plants, divide them in spring and put them in hot beds. This is as good a plan as any, for no growth is made until they are subject to bottom-heat. Still it is little trouble to take cuttings, root them in August and hold them over on shelves in a warm house until spring. Heliotrope and Ageratum may be treated in the same way as Coleus. Cuttings put in in March make good plants. Old stools of Heliotrope and Ageratum have given us quantities of flowers for cutting during winter, and as these have been appreciated we are growing a few specially for this use. The variegated Stevias make pretty decorative plants for which we find use during the winter.

Verbenas, once represented by a long list of named varieties which had to be increased by cuttings taken from kept-over plants, may now be classed with Zinnias, Asters and other annuals to be sown in early spring. There are now so many fine varieties of Begonia semperflorens available for bedding, which can be raised from seed, that few people take the trouble to keep over old plants. I have known seeds of these to retain their vitality through the winter and come up in spring. At Newport, Rhode Island, it is quite common to find thousands of mixed seedlings in beds where these plants grew the year before. Vinca rosea, one of the best of summer bedding plants, comes best from seed, but the seeds must be fresh and there must be a good bottom-heat to start them. Caryopteris Mastacanthus has for two seasons been one of the best plants for autumn bedding. It is quite easily grown from cuttings. Dwarf blue Lobelia, once raised from cuttings, is now to be had in established strains from seed.

Wellesley, Mass. *T. D. Hatfield.*

Iris alata.—This Iris, sometimes known as I. scorpioides, a south European species, is now in flower in a cool house, and marks the beginning of a new season of this great family. Its flowering is, however, sometimes anticipated by that of I. stylosa, a species which, while hardy in this latitude in somewhat sheltered quarters, is preferably grown under protection, for we seldom have such favorable seasons as the present for plants which flower naturally in October and November. I. alata is a bulbous Iris with thick persistent, but not perennial roots, new ones being produced each season as the new bulb is formed. It is an easily managed plant as far as the production of the first flowers, as it starts promptly into growth and flowers as well in a pot as when it is planted out, which is not the case with some of the family. The plants must, however, be carefully ripened up in the warmest and sunniest spot available. The flowers vary somewhat, but are usually light purple, marked with orange on the ridge.

Elizabeth, N. J. *J. N. G.*

The Forest.

Forestry in Women's Clubs.—II.

CIVICS have in the past few years had serious attention in women's clubs, and in Pennsylvania forestry, educational interests and municipal improvements receive special consideration. As indicative of the common interest in forestry it is interesting to note that on October 27th, a day in advance of the meeting of the Federation of Women's Clubs in New Jersey, and entirely independent of the action of that body, forestry proved to be one of the most popular subjects at the annual meeting of the State Federation of Women's Clubs of Pennsylvania, held at Harrisburg.

Miss Mira L. Dock, of that city, known to readers of Garden and Forest through her numerous contributions in articles and illustrations, spoke on Our Forests and Their Utility and Beauty, and described her experiences in a recent tour of observation of woodlands in seven counties of Pennsylvania. The section visited was selected because it represented average, and not extreme conditions, and topographic observations and close study of special features were accomplished in extended drives and walks. Two conditions shown from these examinations were the extreme scarcity of good water and the unkempt condition of the hamlets, villages and towns, both conditions being due to an indifference that has almost ruined the beauty and healthfulness of many portions of Pennsylvania. Almost everywhere an interest in public improvements was noticed, and in each place some one person at least was thinking of a better water-supply, of village improvement or of the great waste of timber, and the growth of sentiment in favor of forestry was very marked. The enactment of the last Legislature of Pennsylvania regarding forest fires was universally approved, and the only criticisms heard regarding the act creating State Reservations of 40,000 acres each at the headwaters of tributaries of the Ohio, Susquehanna and Delaware rivers, were that they were not sufficiently large to insure safety from floods, and that more forest-land should be set aside.

The special interest of Pennsylvania forests in the variety, size and beauty of native trees, in rich forest undergrowth and in botanical interest was sketched by Miss Dock, who said that in the first half of the last century many interesting and valuable trees and plants, mostly from the forests of eastern Pennsylvania, were taken to England. The larger part of these were sent by John Bartram and Humphrey Marshall, both Pennsylvanians born and bred. These two men not only sent valuable American plants to Europe, but they and William Hamilton, of Philadelphia, from his country-seat, now Woodlands Cemetery, in Philadelphia, introduced into this country many valuable species from Europe, among them the Norway Maple, Horse-chestnut and Lombardy Poplar. The first Rhododendrons ever seen in England were sent from the Blue Mountains of Pennsylvania about the time that George Washington was born. Not only is the vegetation in Penn-

sylvania varied, but Pennsylvania is the great meeting-ground for species from northern and southern latitudes. The Catalpa from the west meets the Holly from the coast; the Locust and Magnolia from the south meet the White Birch and Red Spruce from Canada.

In the middle of the last century Peter Kalm, a Swede, when sent over to study forest resources in eastern America, wrote home, "They treat their forests very roughly." The forests of Pennsylvania were once considered inexhaustible, but reckless cutting, fires and floods have ravaged them. Just how inexhaustible a great forest is may be learned if we look at the new state of Washington, where last spring an act was brought before the Legislature declaring that by reason of the lavish waste of valuable timber resources, "an emergency exists," and a law for the protection of forests was presented, to go into effect immediately upon receiving the signature of the Governor.

Miss Dock said two problems of this time are: Can we restore our Forests? Can we maintain our water-supply? These questions forestry tries to answer. Forestry is not simply a love of trees, nor planting them on Arbor Day and then forgetting them, nor above all is it a science or art that would prevent the cutting of trees. An interest may develop from any of these sentiments, but above all else true forestry is business. It means treating a forest as Mr. Cary says, as a field and not as a mine. Timber is a crop that takes from fifty to two hundred and fifty years to ripen and the fields where it grows are hundreds of miles in extent and often lie at considerable elevations. A good farmer keeps his grounds in such a condition that crops may follow each other with perfect regularity, and if his farm lies at different elevations he sees to it that the wash from the upper fields shall not be harmful to the lower fields. In farming when a farm runs down it principally affects the owner. In timber cutting it is just the reverse. The loss and destruction increase in area and extent the farther one travels from a deforested country. The way to understand forestry is to avoid books about trees only, and to study topography, hard and soft rocks, catchment areas and drainage systems; to learn about such minor industries as shingle-making, wood pulp, match factories, etc.; to go into a lumber-camp and see the great expense the lumberman is put to. Then one is in a position to understand that there is a great deal to learn about the subject.

The amount of forest-products proper required in the arts and manufactures can only be faintly realized by long study and much measurement. Take one industry alone, the supply of hemlock bark for tanning purposes: about fifteen million dollars' worth of hemlock bark is needed annually in this country, and Hemlock-trees of the required size are from one hundred to four hundred years of age. Besides the great industries that require timber of large size, there are countless minor industries of which we have daily evidence in the small articles that we need continually and use thoughtlessly.

The second economic factor, water, is of equal importance with the timber supply. All forested areas serve as reservoirs for the collection, storage and slow distribution of the rainfall. Where there is forest-cover from three-fourths to four-fifths of the rainfall under ordinary circumstances percolates slowly into the earth and is returned, through springs and by transpiration, to the vegetation. In a deforested area from three-fourths to four-fifths of the rainfall is immediately carried off by streams, that from mere rivulets, may in an hour become destructive torrents, or, to quote a railway man at an up-county station, "now that the trees are cut away as soon as it rains the floods are on us." There always have been and probably always will be freshets, but what forestry tries to avert are calamitous floods. These are not only destructive to commercial interests throughout their course, but no conditions are so detrimental to health as extreme alternation of low and high water. Low standing water is favorable to the propagation of germs and high water disseminates them to be deposited over wide areas as the water subsides. While water under certain circumstances does purify itself it should be a matter of public interest to inquire into typhoid and other fevers at the head-waters of our streams.

The great industry of mining also depletes the water-supply. Everywhere in coal mining when a new vein is opened it means the disappearance forever of any spring so situated that its waters can be diverted to this easy mode of exit. Once in the mine it becomes so impregnated with sulphur that it cannot be used afterward for household purposes, and in the mining regions, even more than in the lumber country, owing to the large population the forest-cover is needed to conserve all the water possible. Another direct source of loss to individuals and the state of Pennsylvania is the great aggregate of territory, almost four times the size of Rhode Island, of so-called agricultural land, that is yearly decreasing in value. Through the hill and mountain country everywhere roadbeds are torn out, fields seamed and scoured by the wash from nearly perpendicular farms clinging to bare slaty hilltops, and taxation for road repairs and bridge building has become a great burden. It is one of the compensations of Nature that this very land which is unfit in its present condition for agriculture affords congenial soil for some of our most valuable timber-trees to reach their best condition. The Forestry Commission and Board of Agriculture hope that private judgment and public opinion will soon see to the reforesting of these lands, so that they may in time become a source of revenue, instead of loss. In some portions of Germany instead of heavy assessments for bridge building, etc., not only the city expenses are paid, but householders actually receive dividends from the municipal woodlands.

How can a widespread interest be aroused and what of practical value can be accomplished by women's clubs? Everything may be done by taking one thing at a time, and can be accomplished by developing the now latent interest in the beauty of our forests. From an indefinite feeling and indeterminate action, we may have definite ideas and determinate activity by beginning with a study of the local and special, and in time an interest will be aroused in forestry in general. In the last century one young girl of twenty in South Carolina organized, where other planters had failed, the industry of Indigo-planting, that brought millions of dollars into her Province through her unaided pluck and determination. What may not result from concentrated effort of the Federation of the Women's Clubs of a state! Not a village or town of Pennsylvania but has in its vicinity at least some one point of beauty that fifty years from now may be lost beyond recall, which preserved now for a playground or park, would for all time be an object of pride. It is through these local interests that people can be reached and the work done.

The feeling, the raw material and the machinery are all at hand. Part of the machinery is already in motion. Railroad officials were the first to see the value of protecting and beautifying the country through which their roads pass. Public school teachers are doing a great work in their Nature teaching. It now remains for that great network of organizations—the federated clubs, patriotic and religious societies—to do their share in making the land beautiful.

In club work village improvement committees in different parts of the state have a good record, but much desirable land could not be held under existing laws by any of the societies mentioned. To meet this condition Massachusetts incorporated six years ago that noble society of Public Reservations by which the trustees hold beautiful and historic places in any part of the state; and in Massachusetts the general opinion is, that public holdings of land, by giving an interest to all citizens, are of distinct benefit, and add to the value of private holdings. Is it possible for this organization to supply the motive power still needed?

The effect of Miss Dock's address was remarkable in the

general interest it excited, not only when delivered, but in press notices and in invitations for its repetition from teachers, schools and clubs in all sections of the state. At the meeting in Harrisburg it was evident that the more serious the proposition the closer was the attention. A resolution was unanimously adopted by the Federation declaring that, "in consideration of the importance of the preservation and cultivation of the forests of our state, both as a means of maintaining an adequate supply of water and of securing a proper distribution of rainfall, thereby increasing the state's productiveness and consequent wealth, the State Federation, through its clubs and its individual members, should use every effort to arouse interest in our forest conditions and resources with a view to an intelligent understanding of the value of forest preserves and the best means of protection and cultivation."

New York. *M. B. C.*

Notes.

Dr. J. N. Rose, of the United States National Museum, has lately returned to Washington from a five months' botanical expedition through Mexico, bringing with him a collection of more than fifteen hundred species. Most of the collecting was done in the states of Durango, Zacatecas and Jalisco, and in a region which, it is said, has never before been visited by a botanist.

The decadence in training wall fruits has recently been the subject of considerable discussion in several numbers of the *Journal of Horticulture and Cottage Gardener*. The reasons given for the decline of this department of English gardening during the past twenty years are reduced labor, partly caused by the depression in agriculture and in everything pertaining to land; and to the larger outlay for society expenses, the garden being usually the first department of an establishment to feel the effect of economy. Besides, the increasing lavishness in table and house decorations make an excessive demand on labor, so that the vegetables and fruits are neglected and receive only hurried and careless attention. The garden walls which were once the pride of the gardener in their orderly training, and in the health and fruitfulness of the trees, now frequently have an air of neglect and unproductiveness.

The most brilliant plant in northern gardens, now that December has come and leaves have fallen or withered, is the native Black Alder (Ilex verticellata), which, this season, is unusually well covered with its bright red fruits that make a brilliant show in the landscape. Almost equally brilliant are the fruits of the Japanese Berberis Thunbergii, which still retains a few of its scarlet leaves. This Japanese Barberry has proved to be one of the best exotic shrubs which has been introduced into this country, where it appears to be fully appreciated and is now largely planted. No other shrub carries more brilliant fruit through the entire winter, and few shrubs make a braver showing in autumn dress. Some of the American Hawthorns, too, are still brilliant, although their leaves have fallen. The most conspicuous, perhaps, is the Washington Thorn (Cratægus cordata), which is still loaded with its small bright orange-red fruits. Cratægus Crus-Galli, with less brilliantly colored fruit, is beautiful, too, until the very end of winter, and the fruits of Cratægus viridis and Cratægus Carrieri still retain all their beauty of form and color.

The Pacific Rural Press, in a recent issue, describes and figures the Mammoth Blackberry, a hybrid between Rubus ursinus, the common wild Blackberry of California, and the Texas Early, a form of Rubus villosus, recently obtained by Judge J. H. Logan, of Santa Cruz, the originator of the Logan berry. The Mammoth, which is a cross between two plants which produce medium-sized fruit, curiously bears berries of immense size, fruits two and three-eighths of an inch in length being common. The canes of the Mammoth are large and thickly covered with small short spines; starting early in March, they grow thick and stout until about five feet high, and then, becoming pendulous or semiprostrate, grow from twenty-five to thirty feet more during the season; late in the autumn the tips of these shoots take root. Producing no adventitious root-buds, this variety cannot be propagated by root-cuttings, and the only way to multiply it is with stolons. The Mammoth begins to grow and flower early in the spring and ripens its fruit at Santa Cruz the last of May, or some weeks earlier than the Lawton. The flavor of the fruit is described as more acid than that of the Lawton, but when perfectly ripe is said to be sweet; when cooked or canned the flavor is identical with that of the fruit of the wild California Blackberry, which is excellent, although, owing to its poor bearing qualities, it is rarely cultivated.

For Thanksgiving-day trade, last week, tempting arrays of fruits were made in the markets and stores. California grapes were offered in large variety and of excellent quality, and, handsome with their rich bloom, these looked as fresh and crisp as when taken from the vines several weeks ago. New York state grapes, of remarkable freshness for this season, were also displayed in variety, and included good Niagaras and Delawares. Lady-apples, some red bananas, strawberries from California, cocoanuts, pineapples, Italian and French chestnuts and cranberries were all in special demand. Other favorite fruits were Florida oranges and grape-fruits, choice varieties of pears, as Winter Seckel and Comice, and showy apples. During last week 37,633 barrels of the latter fruit were received in this city for the local trade, besides 18,861 barrels for export. Other receipts of fruits last week were two cargoes of cocoanuts from Colon and Trinidad, which comprised nearly 250,000 of these fruits, and four steamers brought 60,000 bunches of bananas from Jamaica and Central America. One cargo from Kingston, Jamaica, consisted of 10,613 barrels of oranges and 665 boxes, besides other shipments of oranges from the same island. There are now on the way from the Mediterranean to this port 6,200 barrels of Almeria grapes, 3,000 boxes of oranges and 60,700 boxes of lemons. Fruits are still coming from the Pacific coast, and twenty-one carloads were sold here last week, of which nineteen were grapes. Other western fruits received were Winter Nelis pears from Oregon, Easter Beurre and other late varieties of pears from California, a carload of new crop Navel oranges from the southern part of the same state, and attractive lemons of excellent quality.

"The Cherry in Delaware" is the title of Bulletin No. 35, issued by the Delaware College Agricultural Experiment Station. In a systematic treatment of the subject, Mr. G. Harold Powell, Horticulturist and Entomologist of the station, clearly explains the classification of this fruit; the practical considerations of soil, location, distance of trees; the propagating of varieties; pruning; cultivation; injurious fungi; insect enemies; climatic injuries; handling the crop and profits. The Cherry interests of Delaware, it is stated, are confined to door-yard and garden spots, and the product is disposed of in the local markets at prices that warrant an extension of the industry. The Cherry-tree thrives best in a warm, dry, loamy soil. The sour Cherry likes more moisture and is hardier. Soils too dry can often be improved by the addition of humus and by cultural aids. The land should be plowed early in spring and receive frequent cultivation until the first or middle of July, and then be seeded to a cover crop. Sour cherries can be grown commercially in all parts of the state, but the sweet Cherry should be confined to the rolling lands of New Castle County. The orchards should be placed on an elevation sloping to the north and the fruit-buds will thus be retarded in spring. Sweet Cherries should be planted thirty feet, and sour Cherry-trees sixteen to eighteen feet apart each way. The buds for the future orchard should be selected from trees of a uniformly heavy-bearing habit, as a promiscuous selection tends to make unlike trees. Sour Cherry-trees should be pruned similarly to the Peach; sweet Cherries should have three to five main arms. Brown rot is the most destructive fungous disease and can be controlled by spraying and by picking the fruit just before it is ripe. Black aphis and curculio are the worst insect enemies. Both are most destructive to the sweet varieties, though the curculio is sometimes serious in the sour kinds. Spraying controls black aphis, and jarring the latter pest. Sun-scald and bursting of the bark are not uncommon and are due to climatic influences. They are favored by nitrogenous fertilizers, late fall growth and exposure of trunk. Care in the selection of soil and in fertilizing, and a low-headed spreading form of tree reduce the danger. Geographical varieties are as yet undeveloped. The most profitable among sour Cherries are Montmorency and Early Richmond, and among sweet varieties, Black Tartarian, Roberts' Red Heart, Napoleon, Windsor and the new Dikeman, described on page 367 of this volume of Garden and Forest. A list of varieties suitable for home use is also given. It is important that the packages for market be small and neat. The purpose of the bulletin is to awaken an interest in the cultivation of this fruit, so that it may help supplement the present products of farms in localities where it can be successfully grown. This interesting pamphlet records a practical experience in the cultivation of Cherries in sections of country where it has for years been a profitable industry, and half-tone illustrations add to the value of the text.